Scales to Measure Safety Behaviors and Flow Related to Music Performance Anxiety in Adolescents

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Introduction

Music Performance Anxiety (MPA) is the experience of unwarranted apprehension of public music performance that can lead to impairment of the performer's actual musical performance (Salmon, 1990). Flow, which is a mental state in which a performer is completely absorbed in his or her performance without any experience of anxiety, has been negatively correlated with MPA (Csikszentmihalyi, 1990).

Safety behaviors can be defined as actions performed with the purpose of avoiding, detecting, escaping, or reducing the risk of a feared outcome (Deacon & Maack, 2008; Helbig-Lang & Petermann, 2010). Although socially anxious individuals believe that these behaviors are beneficial, safety behaviors lead to higher levels of social anxiety.

Safety behaviors do not play a prominent role in prior studies of MPA. The only measure of MPA in adolescence, the MPA Index for Adolescents (MPAI-A), does not include a component for measuring these behaviors.

The current study uses the constructs of flow and safety behaviors to improve our understanding of MPA during adolescence. Using theory, we develop measures of these constructs that are appropriate for use with adolescents.

This study hypothesizes that flow will be associated with lower state anxiety during a performance and better quality performances. Safety behaviors will be associated with higher state anxiety during a performance, less flow during a performance, and poorer quality of performance among adolescents. In addition, the study examines the incremental validity of the safety behavior scales in predicting these outcomes after controlling for the MPAI-A.

Participants

Participants included high school students who were enrolled in one of four orchestra classes (Concert Strings, Chamber Strings, Chamber Orchestra, and Symphonic Orchestra). Of the initial sample (n= 134), 57% (n = 76) participated in the solo and ensemble competition. The initial sample included 35 (27%) Freshmen, 33 (25%) Sophomores, 39 (30%) Juniors, 24 and (18%) Seniors (3 not reported); 75 (58%) females (5 not reporting); and 79 (60%) non-Hispanic whites, 49 (37%) Asian; and 6 other, multiracial, or not reporting. The mean age of the sample was 16.4 (SD = 1.1; range = 14.5 to 18.7).

Procedures

Baseline questionnaires (the demographic questionnaire, the MPAI-A, the Music Performance Flow Scale-Trait Version, and the Music Performance Safety Behaviors Inventory (MPSBI) were distributed and completed during a regularly scheduled classroom session. Students were invited to participate in the competition throughout the next four months, and were able to select which music they would perform, whether they would compete as a soloist or in an ensemble, and which other students they would include in their ensemble. On the day of the competition, performances were overseen by three adjudicators who evaluated performance and gave students both verbal and written feedback. Immediately following the performances and receipt of feedback, participants completed the post-performance questionnaire (the Preparatory Practice Questionnaire, Subjective Units of Distress Scale, and the Music Performance Flow Scale-State Version).

Results

Confirmatory Factor Analysis (Table 2)

- The RMSEA value (0.070) and SRMR value (0.087) indicated an adequate fit.
- Other model fit indices were: MLS χ^2 = 176.77, d.f. = 103; NTWLS χ^2 = 169.98; and GFI = .85.
- The correlation between the factors was .38 (p < .001).
- The two safety behavior scales showed marginal to adequate reliability, with Cronbach alpha internal consistency coefficients of .75 and .63, respectively.

Correlations (Table 1)

- The two safety behavior scales showed good convergence with the MPAI-A scales.
- The two safety behavior scales showed criterion validity when compared with State Flow, and Performance Quality (Reversed), but not State Anxiety.

Hierarchical Multiple Regression (Table 3)

- The dependent variables in these analyses were State Anxiety, State Flow, and Performance Quality (Reversed).
- On Step 1, the three MPAI-A scales and the Preparatory Practice Index were entered as control variables.
- On Step 2 of the analysis, the two safety behavior scales were entered as predictors.
- The regression results for State Anxiety and State Flow were not significant.
- The two safety behavior scales, jointly and individually, accounted for significant variance in Performance Quality (Reverse) after controlling for the Step 1 variables.

Figure 1. Adolescent orchestral musicians.

Table 1. Means (and Standard Deviations) of and Correlations among Study Variables.

	N	Mean (SD)	1	2	3	4	5	6	7	8	9	10
Baseline Measures												
1. General Practice FQ	131	.6 (.9)										
2. MPAI-A - Somatic and Cognitive	134	22.6 (9.7)	.25**									
3. MPAI-A - Performance Context	134	10.0 (5.5)	.11	.73**								
4. MPAI-A - Performance Evaluation	133	11.3 (3.9)	-.24**	.27**	.40**							
5. Trait Flow	134	27.9 (6.5)	.19*	-.15*	-.31**	-.37**						
6. Withdrawal Safety Behaviors	134	13.9 (5.0)	-.35**	.27**	.34**	.42**	-.33**					
7. Overcompensation Safety Behaviors	134	11.4 (4.2)	.01	.32**	.33**	.19*	.01	.28**				
Post-Performance Measures												
8. Participation in Competition (0=no, 1=yes)	134	.6 (.5)	.06	.12	.05	.05	.04	-.11	.07	-		
9. Preparatory Practice FQ	76	3.3 (1.9)	.53**	-.19	-.18	-.32**	.15	-.37**	-.27*	-		
10. State Anxiety	76	31.5 (18.6)	.17	.19	.18	.02	-.06	.09	.09	-.01		
11. State Flow	76	12.9 (3.1)	.13	-.08	-.12	-.21*	.37**	-.24*	.06	-.14	-.05	
12. Performance Quality (Reversed)	76	2.6 (.7)	-.50**	-.05	-.03	.28*	-.1	.41**	.33**	-.51	-.17	-.22+

N's for correlations range from 76 to 134 due to missing data. + two-tailed p < .10, * two-tailed p < .05, ** two-tailed p < .01. FQ = Frequency and Duration Index. MPAI-A = Music Performance Anxiety Inventory for Adolescents.

Table 2. Factor Loadings (Standardized Solution) from the Confirmatory Factor Analysis of the 16 MPSBI Items.

	Factors	
Item	I	II
When I am faced with a challenging piece, I become obsessed with getting it perfect.	0.18	
I spend so much time practicing difficult passages that I neglect the rest of the piece.	0.32	
I write so many notations in my sheet music that I do not understand them.	0.44	
I tend to over-practice.	0.41	
When I'm nervous, I tend to rush through the music.	0.34	
I spend so much time getting the notes right that it sounds mechanical.	0.60	
When it comes to music, I sometimes feel like I try too hard.	0.56	
I focus so much on technique that I lose sight of musicality.	0.54	
When playing in a group, I drop out during difficult passages and come back in when I'm more comfortable.		0.36
When I'm nervous about a performance I avoid practicing.		0.45
When playing a solo, I go slower through difficult passages so I don't mess up.		0.46
I avoid looking at the audience during a performance.		0.47
During practice I don't take risks.		0.56
When the music is difficult I play more quietly than I should.		0.56
During a performance I play it safe.		0.63
I like my music stand to block the audience's view of me.		0.66

N = 134. Factor I = Overcompensation Behaviors. Factor II = Withdrawal Behaviors

Table 3. Results of The Hierarchical Multiple Regression Analyses Predicting Performance Quality (Reversed), Examining the Incremental Criterion Validity of the Scales of the MPSBI.

	After Step 1			After Step 2		
Predictors	B	SE B	β	B	SE B	β
Dependent Variable = Performance Quality (Reversed)						
Step 1 (R² change = 0.32**)						
MPAI-A - Somatic and Cognitive	-.007	.011	-.106	-.009	.01	-.132
MPAI-A - Performance Context	-.013	.019	-.11	-.018	.018	-.153
MPAI-A - Performance Evaluation	.034	.019	.196+	.013	.02	.078
Preparatory Practice FQ	-.174	.037	-.495**	-.136	.037	-.388**
Step 2 (R² change = 0.09*)						
Withdrawal Safety Behaviors				.034	.015	.255*
Overcompensation Safety Behavior				.037	.017	.218*

N = 75. + two-tailed p < .10, * two-tailed p < .05, ** two-tailed p < .01. FQ = Frequency and Duration Index. MPAI-A = Music Performance Anxiety Inventory for Adolescents. Multiple R = 0.64**.

Discussion

- The dimensions underlying safety behaviors with general social anxiety appear to be applicable to the domain of music performance.
- The MPSBI scale reliability was modest. Future research might develop more reliable measures.
- Convergence of the MPSBI scales with the MPAI-A was modest, suggesting that these measures are tapping distinct constructs.
- The MPSBI scales showed prospective criterion validity with respect to performance quality, but not state anxiety. Withdrawal predicted state flow, but overcompensation did not. The relationships with performance were robust.
- Both MPSBI scales predicted preparatory practice, but nothing predicted participation in the competition.
- Nothing predicted state anxiety. State anxiety predicted performance. More research on what predicts state anxiety is needed.
- Trait and state flow scales were not perfectly comparable, although they show content validity. The marginally significant correlation with performance quality suggests some validity.
- The biggest predictor of performance was practice.
- The MPAI-A scales did not predict state anxiety. The MPAI-A performance evaluation scale showed poor reliability, but did predict performance quality. Future research might develop a more reliable measure of this construct.
- Future research should determine whether manipulation of safety behaviors will improve performance.